

What is claimed is:

1 1. A magnetic field sensor characterized in
2 comprising:

3 a magnetic field element for outputting a signal in
4 accordance with an applied magnetic field strength to an
5 output terminal;

6 a switch circuit for inputting the signal of said
7 output terminal of said magnetic field element and for
8 outputting a signal selected by a signal comprising first
9 and second phases given from the outside of said switch
10 circuit, wherein

11 said switch circuit comprises first and second
12 memory elements,

13 in said first phase of said signal given from the
14 outside of said switch circuit, the output voltage of the
15 output terminal of said magnetic field element is stored in
16 said first memory element and the voltage stored in said
17 second memory element is given to said amplifier and,

18 in said second phase, the voltage stored in said
19 first memory element is given to said amplifier and the
20 voltage of the output terminal of said magnetic field
21 element is stored in said second memory element;

22 said amplifier wherein at least one input terminal is
23 connected to the output terminal of said switch circuit and
24 a voltage gained by amplifying the signal of this input

25 terminal is outputted to an output terminal;
26 a third memory element of which one end is connected
27 to said output terminal of said amplifier;
28 a signal output terminal connected to said other
29 terminal of said third memory element; and
30 a switch of which one end is connected to the other
31 end of said third memory element and which carries out
32 opening and closing operations by means of said signal
33 which comprises the first and the second phases given from
34 the outside of said switch, wherein said switch closes in
35 said first phase so that said third memory element stores
36 an output voltage of said amplifier and said switch opens
37 in said second phase so that a sum of said voltage stored
38 in said third memory element and an output voltage of said
39 amplifier is outputted to said signal output terminal.

1 2. A magnetic field sensor according to Claim 1,
2 characterized in that at least one memory element among
3 said memory elements is a capacitor.

1 3. A magnetic field sensor according to Claim 1,
2 characterized in that:

3 said switch comprises first, second and third parallel
4 connections wherein first and second conductive
5 characteristics transistors are connected in parallel, and

6 the connection between two terminals of said first and
7 second conductive characteristics transistors are conducted
8 or cut off by a binary signal given from the outside of
9 said switch,

10 wherein both ends of the second parallel connection
11 are connected to one end of the first parallel connection;
12 and both ends of the third parallel connection are
13 connected to the other end of the first parallel
14 connection; and the first conductive characteristics
15 transistor in the first parallel connection is driven by a
16 different value of the binary signal from a value of the
17 binary signal for driving the first conductive transistors
18 in the second and third parallel connections; and the
19 second conductive characteristics transistor in the first
20 parallel connection is driven by a different value of the
21 binary signal from a value of the binary signal for driving
22 the second conductive transistors in the second and third
23 parallel connections.

1 4. A magnetic field sensor according to Claim 1,
2 characterized in that said magnetic field element is a
3 Hall element.

1 5. A magnetic field sensor according to Claim 4,
2 characterized in that at least one of the resistances for

3 defining the gain of the amplifier is an element of which
4 the manufacturing process is identical to that of the Hall
5 element.

1 6. A magnetic field sensor according to Claim 1
2 characterized in that:

3 a magnetic field sensor further comprises the other
4 signal output terminal, wherein the sum of said voltage
5 stored in said third memory element and an output voltage
6 of said amplifier is outputted from said signal output
7 terminal and the other signal output terminal;

8 said magnetic field element outputs the signal from a
9 first terminal pair in said first phase of the signal and
10 the signal from a second terminal pair in said second phase
11 of the signal in accordance with the applied magnetic field
12 strength, wherein polarities of the signal in said first
13 phase of the signal and said second phase of the signal are
14 mutually opposite;

15 said first and second memory elements are first and
16 second condensers, respectively; and

17 said switch circuit further comprises:

18 a first connection part which connects terminals
19 of said first terminal pair and both ends of said first
20 condenser, respectively;

21 a second connection part which connects terminals

22 of said second terminal pair and both ends of said second
23 condenser, respectively;

24 a first switch part which is inserted and makes
25 a connection in said first connection part and which closes
26 this first connection part in said first phase of the
27 signal and opens this first connection part in said second
28 phase of the signal;

29 a second switch part which is inserted and makes
30 a connection in said second connection part and which opens
31 this second connection part in said first phase of the
32 signal and closes this second connection part in said
33 second phase of the signal;

34 a third connection part which connects both ends
35 of said first condenser to the input terminal of said
36 amplifier as well as to the other signal output terminal,
37 respectively;

38 a fourth connection part which connects both ends
39 of said second condenser to the input terminal of said
40 amplifier as well as to the other signal output terminal,
41 respectively;

42 a third switch part which is inserted and makes
43 a connection in said third connection part and which opens
44 this third connection part in said first phase of the
45 signal and closes this third connection part in said second
46 phase of the signal; and

47 a fourth switch part which is inserted and makes
48 a connection in said fourth connection part and which
49 closes this fourth connection part in said first phase of
50 the signal and opens this fourth connection part in said
51 second phase of the signal.

1 7. A method for detecting magnetic field comprising
2 the steps of:

3 (a) outputting a signal according to an applied
4 magnetic field strength through a magnetic field element in
5 a first signal period;

6 (b) storing said signal in a first memory element and
7 inputting voltage stored in a second memory element to an
8 amplifier in the first signal period;

9 (c) outputting the signal according to the applied
10 magnetic field strength through said magnetic field element
11 in a second signal period, wherein polarities of the
12 signals according to said applied magnetic field strength
13 in the first signal period and the second signal period are
14 mutually opposite;

15 (d) inputting voltage stored in said first memory
16 element to said amplifier and storing the signal according
17 to an applied magnetic field strength in the second memory
18 element in the second signal period;

19 (e) amplifying voltage inputted in the first signal

20 period for outputting a voltage signal across a pair of
21 output terminals of said amplifier and inputting a signal
22 of the pair of output terminals of said amplifier to both
23 ends of a condenser; and

24 (f) amplifying voltage inputted in the second signal
25 period for outputting a voltage signal across a pair of
26 output terminals of said amplifier and inputting a signal
27 of one output terminal in the pair to one end of said
28 condenser, and outputting a signal across the other end of
29 said condenser and the other output terminal of said
30 amplifier to a second pair of output terminals,
31 respectively.

1 8. A method for detecting magnetic field according
2 to Claim 7, characterized in that the magnetic field
3 element outputs said first signal and said second signal in
4 accordance with a Hall effect.

1 9. A method for detecting magnetic field according
2 to Claim 7, characterized by further comprising a step of:
3 (g) halting a power source supply to the magnetic
4 field element in every constant period.